

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant: Song  
Serial No.: 10/770,893  
Filed: February 3, 2004  
Group Art Unit: 1793  
Examiner: Christopher S. Kessler  
Title: CASTABLE HIGH TEMPERATURE ALUMINUM ALLOY  
  
Commissioner for Patents  
P.O. Box 1450  
Alexandria VA 22313-1450

**REPLY BRIEF**

Dear Sir:

The following remarks are in reply to the Examiner's Answer dated May 27, 2010. The Appeal Brief fee has already been paid. Any additional fees or credit may be charged to Deposit Account Number 21-0279 in the name of United Technologies Corporation.

**REMARKS**

Respectfully, the Examiner's Answer raises numerous additional issues that require a brief response as follows.

Regarding Appellant's argument under Section I of the Appeal Brief, the Examiner disagrees with Appellant's characterization of the Watson reference as requiring scandium in the composition. The Examiner points to several citations in Watson that purportedly suggest that the compositions that include scandium are mere example compositions and that one ordinary skill in the art would therefore know that other elements could be substituted for scandium. Respectfully, Appellant disagrees because the "exemplary alloy" that the Examiner refers to is in fact an "exemplary range" of an alloy (col.2, lines 8-10), which suggests that amounts of the elements may be varied, but not whether the listed elements are present or not. Furthermore, Watson even states "in the alloys of present invention, the amount of scandium which soluble in aluminum varies..."

(col., lines 60-61). Therefore, one of ordinary skill in the art would understand the composition of Watson to require scandium.

Additionally, the Examiner argues that even if Watson requires scandium, the presence of other equivalent L<sub>1</sub><sub>2</sub> formers is not negated by the required presence of scandium. Respectfully, the Examiner's argument improperly assumes that the other L<sub>1</sub><sub>2</sub> formers are "equivalent," which they are not because scandium is a required element, as pointed out above.

The Examiner further argues that Appellant does not explain how the substitution of an equivalent functional element would be incorrect and that Appellant has merely argued, without substance, that no equivalents could have been used by one of ordinary skill in the art. Respectfully, the burden is on the Examiner to establish obviousness, which he has not. The Examiner's reasoning in support of the rejection is, in effect, that the other elements are functional equivalents of scandium and can be readily substituted. Thus, the burden is on the Examiner to establish that the other elements are functional equivalents. As pointed out above, scandium is required by the Watson composition and therefore the disclosure of Watson is inconsistent with the Examiner's argument that the other elements are equivalents that can be freely substituted.

Additionally, Applicant's claims recite "approximately 0.1 – 10.0 % by weight of at least one second rare earth element selected from the group consisting of gadolinium, erbium and yttrium if said first rare earth element is ytterbium or the group consisting of ytterbium, erbium and yttrium if said first rare earth element is gadolinium." Thus, the claimed composition is more than a simple substitution of one element for another and requires specific elements based upon whether other elements are present in the composition, which is outside of the teachings of the rigid composition in Watson that requires scandium.

Regarding Appellant's argument under Section II of the Appeal Brief, the Examiner argues that there is no teaching away of using an amount of greater than 10 % rare earth elements as Appellant argued. Respectfully, Appellant continues to disagree. As pointed out previously, the *Titanium Metals Corp.* case that the Examiner relied on for establishing obviousness is inapplicable to the present circumstances. In that case, the Court concluded that the ranges were equal in the absence of evidence tending to establish that the ranges were not equivalent. Such is not the case here, where Higashi discourages using an amount of rare earth element greater than 10% (see col. 2, lines 46-47). Using an amount greater than 10 % would not provide the same properties because the amount influences the crystallization and strength of the alloy (col. 2, lines 46-50). Thus, any

amount over 10 % is not merely “wasted” as the Examiner proposes but instead functions to debit the alloy and would not be functionally equivalent to an amount that is less than 10 %.

Regarding Appellant’s argument under Section III of the Appeal Brief, the Examiner asserts that the elements from the ASM Handbook reference would have been present in trace amounts as inevitable impurities and that the ASM Handbook reference is therefore evidence of inherency. The Examiner further asserts that Appellant has not provided any evidence that the elements would not have been inherent but just arguments to that effect. However, the Examiner is improperly attempting to shift the burden to Appellant. The burden is on the Examiner to establish *prima facie* obviousness and that the claimed “at least one minor alloy element” would necessarily be present in the prior art. The ASM Handbook reference that the Examiner points to does not explicitly state that all of the listed elements would necessarily be present in an aluminum alloy. Therefore, the Examiner’s assertion that “these elements would have been present in trace amounts as inevitable impurities in the aluminum” is, at best, an unsupported allegation and does establish obviousness.

Regarding Appellant’s arguments under Section IV of the Appeal Brief, Appellant disagrees with the Examiner’s answer for the same reasons as stated above with regard to Section I of the Appeal Brief.

**Closing**

For all the reasons set forth above and the reasons set forth in Appellant’s Appeal Brief, the rejections of the claims are improper and must be reversed.

Respectfully submitted,

/Matthew L. Koziarz/

Matthew L. Koziarz, Reg. No. 53,154  
Carlson, Gaskey & Olds  
400 W. Maple Road, Ste. 350  
Birmingham, MI 48009  
(248) 988-8360

Dated: July 22, 2010